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Notes on Preventive Medicine for Medical Officers, United States Navy.

INSTRUCTIONS TO MEDICAL OFFICERS.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., November 9, 1918.

NOTES ON THE PRESENT EPIDEMIC OF INFLUENZA.

Up to and including November 9, 1918, there have been reported from all shore stations in the United States 54,585 cases of influenza with 2,795 deaths. For the week ended November 9, 1918, there were 1,295 cases reported from shore stations as against 1,793 cases reported during the week ended November 2, 1918. Except for four new cases which developed in the Pacific Fleet no recent reports have been received from other ships. The total number of cases so far reported from the force afloat is 8,564 with 332 deaths, making a grand total for ships and shore stations of 63,149 cases of influenza with 3,127 deaths.

The following table furnishes the latest information of a statistical nature:

	Total influenza to date.	New cases week ended Nov. 9.	New cases week ended Nov. 2.	Total deaths.	Case fatality rate per cent.
Third naval district.....	5,235	136	267	270	5.15
Naval training camp, Pelham Park, N. Y.....	2,615	3	28	108	4.13
Marine barracks, Quantico, Va.....	2,802	284	195	104	3.71
Sixth naval district, exclusive of training camp, Charleston, S. C., and marine barracks, Paris Island, S. C.....	905	48	12	64	3.19
Naval training camp, Charleston, S. C.....	1,100	44	74		
Marine barracks, Paris Island, S. C.....	781	146	283	19	2.43
Eighth naval district, exclusive of naval station, New Orleans, naval station, Pensacola, and naval training camp, Gulfport, Miss.....	300	6	33	7	2.33
Naval station, New Orleans, La.....	1,012	11	11	34	3.35
Naval station, Pensacola, Fla.....	1,474	5	20	24	1.62
Naval training camp, Gulfport, Miss.....	875	7	3	20	2.28
Twelfth naval district, exclusive of naval training camp, San Diego, Cal., naval station, Mare Island, Cal., and naval training station, San Francisco, Cal.....	1,553	121	284	39	2.51
Naval training camp, San Diego, Cal.....	1,087	23	74	6	.55
Naval station, Mare Island, Cal.....	1,415	123	144	71	5.01
Naval training station, San Francisco, Cal.....	0				
Other shore stations.....	33,431	338	365	2,029	6.06
Total, shore stations.....	54,585	1,295	1,793	2,795	5.11
Ships.....	8,564			332	3.88
Grand total.....	63,149			3,127	4.94

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The following figures relative to the results obtained after the use of influenza vaccine at the marine barracks, Paris Island, S. C., are furnished by the senior medical officer at the marine barracks, Quantico, Va.:

A draft of 756 men was received from Paris Island, in the early part of November. Of these, 304 had not been vaccinated against influenza, and 39 or 12.8 per cent of them have since contracted the disease. Four hundred and fifty-two men of this draft had received from one to four inoculations of influenza vaccine and 72 or 15.9 per cent afterwards contracted influenza as follows:

After one inoculation, 11 out of 75 men (14.6 per cent) developed influenza.

After two inoculations, 30 out of 226 men (13.2 per cent) developed influenza.

After three inoculations, 8 out of 57 men (14 per cent) developed influenza.

After four inoculations, 23 out of 94 men (24.4 per cent) developed influenza.

Deaths (stillbirths excluded) reported during the week ended Nov. 2, 1918, with death rates, in large cities of the United States.

Cities.	Week ended Nov. 2, 1918.		C=corresponding week, 1917; A=average of week, 1913-1917.		Cities.	Week ended Nov. 2, 1918.		C=corresponding week, 1917; A=average of week, 1913-1917.	
	Total deaths.	Annual rate per 1,000.	Total deaths.	Annual rate per 1,000.		Total deaths.	Annual rate per 1,000.	Total deaths.	Annual rate per 1,000.
Albany.....	184	90.0	C 36	17.6	Newark.....	402	50.1	A 98	12.8
Atlanta.....	79	21.0	C 38	23.4	New Haven.....	223	76.4	C 34	11.6
Baltimore.....	613	53.8	A 176	15.7	New Orleans.....	455	62.9	A 149	21.2
Birmingham.....	123	33.8	A 54	16.3	New York.....	5,819	52.9	A 1,209	11.5
Boston.....	319	21.7	A 215	15.0	Oakland.....	279	70.5	A 37	10.0
Buffalo.....	613	67.2	A 107	12.1	Omaha.....	128	37.5	C 27	8.4
Cambridge.....	42	19.2	A 28	12.9	Philadelphia.....	1,771	53.2	466	14.2
Chicago.....	2,191	44.9	A 576	12.3	Pittsburgh.....	1,132	100.7	C 205	18.2
Cincinnati.....	382	48.1	C 119	15.0	Portland, Oreg.....	213	36.0	C 43	7.3
Cleveland.....	870	65.6	C 163	12.3	Providence.....	201	40.3	C 45	9.0
Columbus.....	139	32.9	C 58	13.7	Richmond.....	100	32.9	C 51	16.8
Dayton.....	148	59.9	A 31	12.7	Rochester.....	254	50.0	C 76	15.0
Denver.....	155	30.1	A 60	12.4	St. Louis.....	426	28.9	C 227	15.4
Fall River.....	69	27.7	C 39	15.7	St. Paul.....	149	30.8	C 39	8.1
Grand Rapids.....	49	19.2	C 29	11.4	San Francisco.....	804	89.0	C 178	19.7
Indianapolis.....	169	31.1	C 96	17.7	Seattle.....	148	21.1	A 46	7.3
Kansas City, Mo.....	291	49.6	C 91	15.5	Spokane.....	42	13.9	C 26	8.6
Los Angeles.....	533	51.9	A 99	11.0	Syracuse.....	95	31.3	C 36	11.8
Louisville.....	159	34.4	C 38	8.2	Toledo.....	175	45.2	A 58	16.0
Lowell.....	63	28.7	A 36	16.6	Washington, D. C.....	302	42.6	A 116	16.8
Memphis.....	105	36.0	C 49	16.8	Worcester.....	102	32.0	C 52	16.3
Milwaukee.....	208	24.4	A 86	10.5					
Minneapolis.....	203	28.3	C 69	9.6					
Nashville.....	93	41.0	C 42	18.5	Total.....	21,020	48.0

In the cities listed above there have been 74,232 deaths from influenza and pneumonia during the eight weeks ended November 2, 1918. The figures by weeks are as follows:

Disease.	Sept. 14.	Sept. 21.	Sept. 28.	Oct. 5.	Oct. 12.	Oct. 19.	Oct. 26.	Nov. 2.
Influenza.....	19	193	904	2,716	6,809	12,289	13,110	9,743
Pneumonia.....	299	405	855	2,044	4,606	7,648	7,734	4,858

A REPORT ON THE FINDINGS IN 116 NECROPSIES PERFORMED IN THE U. S. S. MERCY ON BODIES DEAD OF INFLUENZA.

By Lieut. THOMAS L. RAMSEY (Medical Corps), U. S. N. R. F.

The epidemic of influenza started in the Atlantic Fleet early in September. The cases first coming to autopsy were those of simple broncho-pneumonias with a mixed bacteriology. These were characterized by nodular consolidated areas in one or more lobes around central bronchioles which were filled with pus. These areas were surrounded by congested and oedematous lung tissue involving sometimes an entire lobe. At times two or three lobes were involved.

Material taken from affected areas was first streaked on blood agar plates and then smeared on glass slides and stained. Gram stains of the direct smears showed a mixed bacteriology, the pneumococcus predominating. Other bacteria found were staphylococci, *Micrococcus catarrhalis*, streptococci, *Bacillus mucosus*, and influenza bacilli.

The blood agar plates were incubated and colonies studied from time to time as they made their appearance. In this manner the various microorganisms were identified as the colonies became visible.

Colonies identified as pneumococci were fished and transplanted into Avery's rabbit-blood broth which after eight hours' incubation was subjected to agglutination tests with specific type sera. In this manner organisms were grouped according to type. Intraperitoneal inoculation of white mice was resorted to when agglutination reactions in the Avery media were obscure. Other organisms were also identified from day to day as they made their appearance on the plates. It was noticed that the fine colonies of influenza bacilli could not be detected until after three or four days' incubation.

This routine procedure of making direct smears from the affected parts and of growing cultures for study was continued on all cases which came to autopsy during the epidemic.

After the epidemic had lasted for a few days it was noticed that broncho-pneumonic areas were increased in extent as compared with earlier cases, that is more lung tissue was involved and hemorrhages into the lung around affected areas were so extensive that whole lobes were filled with a combination of consolidated areas and blood clot. Pleurisy with effusion, and the formation of purulent plastic exudates with adhesions were noted more frequently and pericardial involvement, the result of direct extension, was found in many cases. Cultures now showed the infection to be more truly pneumococcic as pure cultures of this organism were obtained from the infected parts in nearly every case. Cultures from the heart's blood showed that septicemia was present in every case where purulent fluid was found in the chest. This proved to be due to a Type II pneumococcus in every instance.

When septicemia cases began to appear autopsy findings indicated that the patients had succumbed to infection with a much more virulent microorganism and the lung findings were not nearly so pronounced. Some of the cases proved to be hemorrhagic septicemia with no lung involvement other than extensive hemorrhages which sometimes occurred into the lung tissues. The important lesions found in this group of cases were hemorrhages into the lungs, ventricles of the brain or suprarenal glands. Later, cases of meningeal involvement with or without broncho-pneumonia, began to be seen. Many of these cases before death had no signs of meningeal involvement other than those of the accompanying septicemia, but at autopsy they showed a purulent spinal fluid containing pneumococci.

From these findings one can readily see that the infection which started as a rather mild complicating broncho-pneumonia rapidly increased in virulence until it reached its climax in the involvement of the blood stream and meninges.

The cases autopsied were divided into the following groups:

- Group I. Simple broncho-pneumonia.
- Group II. Lobar pneumonia.
- Group III. Massive broncho-pneumonia.
- Group IV. Hemorrhagic broncho-pneumonia.
- Group V. Broncho-pneumonia with septicemia.
- Group VI. Broncho-pneumonia with meningitis.
- Group VII. Hemorrhagic septicemia.
- Group VIII. Pneumococcus meningitis.

In 9 of the 116 cases no organisms were recovered, because the bodies had been kept in the mortuary ice box before coming to autopsy.

The pathology of these groupings is submitted separately in order to bring out more clearly the differential findings.

GROUP I. SIMPLE BRONCHO-PNEUMONIA (8 CASES).

Pathology.—The findings are those of broncho-pneumonia; namely, one or more lobes showing areas of consolidation around the smaller bronchioles which were filled with pus, the air spaces themselves being filled with purulent material. In the early stages of the disease the consolidated area was reddish to reddish brown, turning gray as resolution set in. The surrounding lung tissue was congested and oedematous sometimes extending to other consolidated areas in the same lobe, thus simulating consolidation of the entire lobe. The heart was rarely involved in this type of cases except when acutely dilated as a terminal process. Cultures from the heart's blood were negative. There were eight cases in this group, and pneumococci were found in lung cultures from seven. In one case the bacteriology was not determined.

The types of pneumococci found were: Type I, 3 cases; Type II, 2 cases; type not determined, 2 cases.

Associated with pneumococci there were found staphylococci, streptococci, *B. influenzae*, *B. mucosus*, and *M. catarrhalis*, indicating a very mixed bacteriology in this group.

GROUP II. LOBAR PNEUMONIA (7 CASES).

Pathology.—The consolidation found in this group was typically that of true lobar pneumonia, the lung involvement being usually unilateral, with no hemorrhages into the lung tissue, no complicating pleurisy except of a dry fibrous character which was found in one case. There was no myocardial involvement, although acute dilatation of the heart was found in two cases with extensive lung involvement. The heart's blood was negative for bacteria. Direct smears from lungs were positive for pneumococci in five cases.

Type II pneumococcus was found in one case. Pneumococci in the other four cases were not typed. Staphylococci, *B. influenzae* and *B. mucosus* were found associated in several of the cases. The bacteriology in two instances was not determined.

GROUP III. MASSIVE BRONCHO-PNEUMONIA (33 CASES).

Pathology.—That of a very extensive broncho-pneumonia where the areas of consolidation around the pus filled bronchioles were so numerous and adjacent as to cause consolidation of nearly, if not all, of the affected lobe. Several lobes were involved, with congestion and edema of the other parts; and the breathing capacity was much impaired. The body for the most part was very much discolored, and the right heart was acutely dilated in almost every instance. In 14 cases the pleura was involved by direct extension of the inflammatory process with adhesions fibrous in character. Myocarditis and nephritis occurred in a small percentage of these cases, probably due to febrile disturbances. Heart blood was negative for bacteria in this series. No case with effusion or purulent exudate was classified in this group.

The bacteriology was determined in 30 cases.

Pneumococci found in 26 cases: Type I, 5 cases; Type II, 2 cases; Type III, 5 cases; Type IV, 4 cases; type not determined, 10 cases.

Staphylococcus occurred alone in 2 cases, associated in 12. *B. influenzae* occurred alone in 2 cases, associated in 9. Bacteriology not determined in 3 cases.

GROUP IV. HEMORRHAGIC BRONCHO-PNEUMONIA (18 CASES).

Pathology.—That of massive broncho-pneumonia type, associated with extensive hemorrhages into the lung tissues so that affected lobes were completely filled with blood. Several lobes were involved in many cases; those not involved in the hemorrhagic process were very much congested and edematous, thereby impairing the breathing space. The pleura was sometimes involved by direct extension of the inflammatory process. Adhesions, if any, were fibrous in character. There was no effusion or purulent exudates in this series, and the heart's blood was negative for bacteria. Associated myocarditis and nephritis occurred in many of the cases.

Bacteriology determined in 18 cases.

Pneumococci found in 18 cases: Type I, 1 case; Type II, 5 cases; Type III, 4 cases; Type IV, 1 case; type not determined, 7 cases.

Staphylococcus associated in 9 cases; streptococcus associated in 3 cases; *B. influenzae* associated in 3 cases; *B. mucosus* associated in 1 case.

GROUP V. BRONCHO-PNEUMONIA WITH SEPTICEMIA (26 CASES).

Pathology.—The broncho-pneumonia found had not developed to any great extent before the more septic process terminated fatally. Empyema occurred in a large percentage of this group along with plastic purulent exudates into the thoracic cavity, pericardium, and even into the peritoneum. Adhesions of lung to thoracic wall occurred in most of these cases. Cultures from exudates and heart's blood contained pneumococci in every case. Myocarditis and endocarditis with vegetations on the heart valves occurred in a large percentage of the cases. Nephritis was found in 20 of the 26 cases.

Bacteriology determined in 25 cases.

Pneumococci were isolated in 23 cases: Type I, 2 cases; Type II, 7 cases; Type III, 6 cases; type not determined, 8 cases.

Staphylococcus associated in 11 cases; streptococcus associated in 4 cases; *M. catarrhalis* associated in 2 cases; *B. influenzae* associated in 6 cases; *B. mucosus* associated in 2 cases; streptococcus viridans pure culture, in 2 cases. Bacteriology not determined in 1 case.

GROUP VI. BRONCHO-PNEUMONIA AND MENINGITIS (12 CASES).

Pathology.—The broncho-pneumonic process had not progressed extensively before associated meningitis occurred through invasion of the blood stream by the pneumococcus. In many cases death occurred early, even before marked meningeal symptoms had developed, the meningeal involvement being found post-mortem by spinal puncture, purulent fluid containing pneumococci being obtained. On opening the cranium, the brain was found covered with thick purulent material just beneath the pia, chiefly involving the vertex of the brain, the base being involved to a lesser extent. This purulent meningitis extended down the cord also, just beneath the pia mater. Sometimes this exudate was so thick in the spinal canal that nothing could be obtained by spinal puncture. No involvement of the myocardium was found in this group. Heart's blood cultures were positive in a large percentage of the cases.

The bacteriology was determined in 12 cases.

Pneumococcus was found in 12 cases: Type II, 8 cases; type not determined, 4 cases.

Note.—All pneumococci found in this condition proved to be Type II.

Staphylococcus was found associated in 3 cases. Streptococcus viridens was found associated in 3 cases. *B. influenzae* was found associated in 1 case. *B. mucosus* was found associated in 1 case.

GROUP VII. HEMORRHAGIC SEPTICEMIA (5 CASES).

Pathology.—In this group no broncho-pneumonia was found, the lungs not being involved in any pneumococcal process although extensive hemorrhages had occurred into the lung tissue in two cases. Blood was obtained from the spinal canal by puncture in two cases. On opening the cranium in one case the ventricles of the brain were found filled with blood, due to hemorrhage from the choroidal plexus into the lateral ventricles. In four cases extensive hemorrhage was found in the suprarenal glands, entirely destroying the gland substance; in one of these cases no other pathology was found except this suprarenal apoplexy. Intraventricular apoplexy was found in one case, no involvement of the suprarenals being found. In no case was there involvement of the myocardium. Kidneys showed inflammatory involvement in a majority of these cases. Cultures from the heart's blood were generally negative, only one positive blood culture being found which proved to be a Type I pneumococcus.

Pneumococcus found in lung smears in 2 cases, type not determined. No bacteria found in 1 case. Staphylococcus was found associated in 1 case. *B. mucosus* was found associated in 1 case.

GROUP VIII. PNEUMOCOCCIC MENINGITIS¹ (7 CASES).

Pathology.—In this group meningitis was the predominating post-mortem finding. The brain and spinal cord were extensively involved. Spinal fluid obtained by puncture contained large numbers of pus cells and pneumococci. There was no lung involvement. Cultures from the heart's blood were positive, pneumococci being found in five cases. In two cases small hemorrhages into the lung tissue were found. In one case hemorrhage into one of the suprarenal glands was found.

The bacteriology was determined in 7 cases.

Pneumococcus was found in 7 cases: Type I, 1 case; Type II, 1 case; Type IV, 1 case; type not determined, 4 cases.

Staphylococcus found associated in 1 case. Streptococcus associated in 1 case. *B. mucosus* associated in 1 case.

¹ It has since been reported from the U. S. Naval Hospital, Norfolk, Va., that nine patients were admitted to hospital from the U. S. S. *Mercy* with diagnosis of meningitis, cerebrospinal. The health records of four contained notes stating that pneumococci were found in the spinal fluid. There were no notes regarding laboratory findings in the other cases. All had received polyvalent antipneumococcal serum intraspinally, and most of them intravenously also. All except one had been treated on the *Mercy* for periods of from twelve to twenty-one days. One had been on the *Mercy* only five days.

On admission to this hospital two cases were convalescent. The remainder ranged from moderately to seriously ill. One died the night after admission. Meningococci were found in four of the cases, including the one terminating fatally. Spinal puncture was not done in the two convalescent cases. Two of the negative cases showed clear fluid, and the others, slightly cloudy fluid. No pneumococci were found in any case.

Group.	Total number of cases.	Number cases pneumococcus found in culture.	Types of pneumococcus.	No type identified.	Bacteriology not determined.	Staphylococcus alone.	Associated.	Streptococcus alone.	Associated.	B. influenzae alone.	Associated.	B. mucosus alone.	Associated.	M. catarrhalis alone.	Associated.	Note.
I. Simple broncho-pneumonia.....	8	7	$\begin{Bmatrix} I & 3 \\ II & 0 \\ III & 0 \\ IV & 2 \end{Bmatrix}$	$\begin{Bmatrix} 2 \\ 1 \end{Bmatrix}$	2	2	1	1	4	1	2	1	2	1	2	Bacteriology very mixed.
II. Lobar pneumonia.....	7	5	$\begin{Bmatrix} I & 1 \\ II & 1 \\ III & 0 \\ IV & 0 \end{Bmatrix}$	$\begin{Bmatrix} 4 \\ 2 \end{Bmatrix}$	2	2	2	0	2	1	0	1	0	1	0	Probably Type II infections.
III. Massive broncho-pneumonia..	33	26	$\begin{Bmatrix} I & 5 \\ II & 2 \\ III & 5 \\ IV & 4 \end{Bmatrix}$	$\begin{Bmatrix} 10 \\ 3 \end{Bmatrix}$	12	2	12	3	9	2	3	2	2	2	2	Bacteriology very mixed.
IV. Hemorrhagic broncho-pneumonia.	18	18	$\begin{Bmatrix} I & 5 \\ II & 4 \\ III & 4 \\ IV & 1 \end{Bmatrix}$	$\begin{Bmatrix} 7 \\ 0 \end{Bmatrix}$	9	3	9	3	3	3	1	1	1	1	1	Pneumococcus Types II and III predominating.
V. Septic broncho-pneumonia.....	26	23	$\begin{Bmatrix} I & 7 \\ II & 6 \\ III & 6 \\ IV & 0 \end{Bmatrix}$	$\begin{Bmatrix} 8 \\ 1 \end{Bmatrix}$	11	2	11	4	6	4	2	2	2	2	2	Two cases streptococcus viridens. Types II and III pneumococcus predominate.
VI. Broncho-pneumonia with meningitis.	12	12	$\begin{Bmatrix} I & 8 \\ II & 0 \\ III & 0 \\ IV & 0 \end{Bmatrix}$	$\begin{Bmatrix} 4 \\ 0 \end{Bmatrix}$	3	3	3	3	1	3	1	1	0	1	0	All pneumococci identified were Type II.
VII. Hemorrhagic septicemia.....	5	3	$\begin{Bmatrix} I & 1 \\ II & 0 \\ III & 0 \\ IV & 0 \end{Bmatrix}$	$\begin{Bmatrix} 2 \\ 2 \end{Bmatrix}$	2	2	2	0	0	0	1	1	0	1	0	Positive blood culture in only one case. Condition one of toxemia.
VIII. Pneumococcus meningitis...	7	7	$\begin{Bmatrix} I & 1 \\ II & 1 \\ III & 0 \\ IV & 1 \end{Bmatrix}$	$\begin{Bmatrix} 4 \\ 0 \end{Bmatrix}$	1	1	1	1	0	1	1	1	0	1	0	Three heart's blood cultures, positive, pneumococci, various types.
Total.....	116	101	$\begin{Bmatrix} I & 13 \\ II & 24 \\ III & 15 \\ IV & 8 \end{Bmatrix}$	$\begin{Bmatrix} 41 \\ 9 \end{Bmatrix}$	42	2	42	2	25	2	10	0	7	0	7	Predominating Types II and III.

REPORT OF INFLUENZA OUTBREAK IN THE THIRTEENTH NAVAL DISTRICT.

(A report submitted by the medical aid to the commandant of the thirteenth naval district.)

Influenza first appeared in serious form in this naval district September 17, 1918. September 16 a draft of 334 men was received from Philadelphia. This draft reached Seattle, Wash., at about 9 p. m., and was ferried across the sound on barges, disembarking at about 11 p. m. Many of the men were inadequately clothed. Few, if any, had overcoats, nor were they properly supplied with blankets. A number complained of cold on the trains. Eleven were sick upon arrival, and, while waiting around the detention camp for their clothing, blankets, and disinfection of their effects, some became so ill that it was necessary to remove them at once to the sick bay and later to hospital. The men were up almost all night in the process of reception.

On September 18 and September 20 approximately the same number of men were received at the same time and under practically the same circumstances. These three drafts from Philadelphia were kept in isolation for a period of one month in the detention camp, navy yard, Puget Sound.

Of the first draft, 11 were sick upon arrival; of the second, it was necessary to remove 8 to sick quarters by ambulance, and 23 had to fall out during muster; of the third draft, 8 arrived by ambulance and 5 fell out during muster. Most of those who fell out during muster, or "dropped in their tracks," to use the words of the medical officer, were suffering from exhaustion, for they recovered the following day.

Our experience with the disease has been similar to that in other districts throughout the United States. The disease has shown special predilection for the enlisted personnel, especially those between the ages of 18 and 26, large numbers of whom have come down within a very short space of time.

On September 24, 1918, at a meeting of the board of health, thirteenth naval district, the question of quarantine against influenza was brought up and discussed. The following recommendations were made:

- (a) That cases of influenza be isolated as early as possible.
- (b) That all men remain away from public gatherings, such as theaters, dance halls, etc., for a period of 30 days.
- (c) That attention be called to the dangers of coughing, sneezing, and expectorating.
- (d) That men be instructed through their chief petty officers, or in such other way as seems best to their commanding officers, relative to sneezing, coughing, and expectorating, and that men found to be sneezing or coughing be sent to sick bay at once for treatment.
- (e) That men be warned against using drinking fountains in public places outside of the navy yard.
- (f) That the roads and parade grounds be sprinkled at least twice daily.

These recommendations were officially approved.

In the meantime, Surg. B. J. Lloyd, United States Public Health Service, sanitary adviser and inspector, thirteenth naval district, addressed the various units of the training camp on the subject of prevention in relation to influenza, at which time it was pointed out that the epidemic then raging in the East would undoubtedly reach the Puget Sound station very soon.

Early in the epidemic it became apparent that the naval hospital, navy yard, Puget Sound, would be able to care for only the more serious cases, and that of necessity it could receive patients only from the 7,000 men attached to the navy yard, Puget Sound. September 28 the medical aid canvassed the various hospitals in Seattle with a view toward securing accommodations for the sick of the command at the Seattle training camp who might require hospital treatment. This survey was most unsatisfactory, as practically no outside hospital accommodations were available.

Tuesday, October 1, the president of the University of Washington was interviewed, and he very kindly allotted Lewis Hall, an unoccupied dormitory, for use as a temporary hospital. By this time the sick bay, hostess house, and armory were crowded with the sick, and as immediate results were imperative assistance was asked from the Red Cross through the local director. By October 2 Lewis Hall was completely equipped for service as a temporary hospital. Women nurses and a sufficient number of medical officers were secured with the approval of the bureau and our prospects became brighter.

This epidemic has been characteristic in so far as its tendency to attack large numbers in a short space of time is concerned. Doctors and nurses were not immune. At the naval hospital 5 doctors and 6 nurses sickened in a few days. One doctor and 1 nurse succumbed. At the naval training camp, navy yard, Puget Sound, 3 doctors were attacked. At the naval training camp, Seattle, 4 doctors and 5 nurses became ill. About 20 Hospital Corpsmen also contracted the disease. All but those infected at the naval hospital recovered. The rapidity with which some have been seized with this disease and have succumbed to the infection has been appalling. Many who suffered with severe attacks, after they had been ill for three days, bore a striking resemblance to patients in the third week of typhoid fever.

The effect of the epidemic upon the city of Bremerton and its influence upon the civilian personnel attached to this navy yard was appreciated. On September 27 the medical aid personally consulted with the physicians of Bremerton, at which time they were warned to take measures to control the epidemic. It was suggested that churches, moving pictures, theaters, lodges, dance halls, skating rinks, and schools be closed; that the streets be sprinkled frequently, as at this time there had been quite a dry spell.

The effects of the disease have, at this time, been so protean that it seems best to discuss them in only a general way, reserving detailed observations for a later report. The lungs, pleuræ, kidneys, brain, gall bladder, larynx, stomach, and intestines have all been attacked. The outstanding feature in serious cases is toxemia. In 75 per cent of the cases examined the hemolytic streptococcus has been obtained from the blood and from the organs mentioned above. Organisms have been recovered from the blood as early as 18 hours after the attack. Pneumococci have been recovered from the blood in only one case. The bacillus of Pfeiffer has not been found in any case.

At the suggestion of the sanitation officer, a vaccine was prepared from a hemolytic streptococcus isolated on September 25, and tried out on a few volunteers. There were no ill effects. It was then decided to vaccinate as many men as the facilities of our bacteriological laboratory would permit. Accordingly, from September 30 to October 25, 3,200 enlisted men, including marines who had not had influenza were given three injections at 48-hour intervals, starting with 60,000,000 for the first dose, 120,000,000 for the second dose, and 240,000,000 for the third dose. In our experience there have been practically no untoward effects from the use of this vaccine.

The following record has been compiled from data procured in the training camps in connection with the use of the vaccine. Of 2,800 men who were vaccinated, 45 suffered mild attacks of influenza following the first injection; of the remainder, 8 were attacked after the second injection and 2 after the third. A draft of 111 Filipinos reported on October 4, during the height of the epidemic, and were isolated at once. They received three prophylactic injections, and only 2 of them were attacked. Eighty-three machinist's mates for aviation, who arrived on October 3, were isolated and vaccinated. Thirty-one contracted influenza after the first injection; 1 only after three injections. Three hundred and sixty-one Marines were vaccinated; 2 came down with influenza after the first injection; none were affected after the third. Sixty-two marines at the ammunition depot were vaccinated; 2 were taken with influenza after the second injection, and 1 after the third, no others being affected. Six hundred and sixty-two blue jackets, members of the naval unit attached to the University of Washington, were vaccinated; 3 came down after the first injection; 1 after the second, and 7 after the third. No deaths have occurred among those who have been vaccinated, and pneumonia has thus far not developed in those inoculated. Hemolytic streptococcus vaccine was first administered on September 30, 1918. It was impossible for us to prepare the vaccine in requisite amounts in time to inoculate the 11,000 men attached to the two training camps mentioned above. However, an effort was made to inoculate those who had not had the disease and who could be controlled for observation. Later on vaccine was furnished to the health departments of the cities of Seattle, Portland, and Bremerton. Copies of letters received from the Washington State commissioner of health and the city health officer of Seattle, Wash., are inclosed. It is believed that the administration of this vaccine has been justified by the results obtained. Our experience has forced us to the conclusion that while the influenza bacillus may or may not have been the original factor in connection with the epidemic in the East, the hemolytic streptococcus has been responsible for the deaths here and our efforts have been directed toward immunization against this organism.

Naval training camp, Seattle, Wash.:	
Complement.....	4, 159
Number of admissions for influenza from Sept. 25, 1918, to Oct. 21, 1918.....	813
Deaths.....	33
Percentage of complement attacked.....	19.54
Case fatality rate.....	4.05
Naval training camp, navy yard, Puget Sound, Wash.:	
Complement.....	6, 466
Number of admissions for influenza from Sept. 25, 1918, to Oct. 21, 1918.....	633
Deaths.....	63

Naval training camp, navy yard, Puget Sound, Wash.—Continued.	
Percentage of complement attacked.....	9.79
Case fatality rate.....	9.95
Philadelphia draft (included in complement for navy yard):	
Complement.....	1, 007
Number of admissions for influenza from Sept. 25, 1918, to Oct. 21, 1918.....	205
Deaths.....	21
Percentage of complement attacked.....	20.3
Case fatality rate.....	10.2

In a general way it may be stated that we are still in doubt as to the etiology of this outbreak. The influenza bacillus has not been isolated in any case. If we are dealing with two distinct types of disease it is our opinion that if the influenza bacillus was responsible for the beginning of this pandemic, as far as our experience in this district is concerned, this organism is without importance. We are dealing here, especially in the serious cases, with a hemolytic streptococcus, which may be a primary or a secondary invader and which is responsible for our mortality. The pneumococcus has been isolated in only one instance. In practically all other cases examined the hemolytic streptococcus has been found in the blood as early as 18 hours after invasion, and in the blood of some who have recovered. Our results with the vaccine referred to previously would seem to bear out our contention which points toward the streptococcus as the culprit. We feel certain that overcrowding, with its increased opportunity for cross infection, is of the greatest importance as a predisposing factor.

It is further submitted that greater care in transporting troops under certain circumstances should be observed. Contracts with railroads should provide for adequate heating, sufficient bed clothing, and one berth per man. Troops to the number of 100 or over should be accompanied by a medical officer. Troops should not be detained at night. Trains arriving late at night should be sidetracked and remain intact until morning, if in the judgment of the medical officer and officer in charge of the detachment such procedure is warranted. It is believed that the high mortality in the Philadelphia draft was due in part to the conditions under which they were transported to this yard.

Too much can not be said by way of appreciation with regard to the whole-hearted assistance which has been rendered at a time of great emergency by commanding officers, doctors, nurses, Hospital Corpsmen, the president of the University of Washington, and the director of the Seattle division of the American Red Cross.

Diseases reported in 1 ship of the fleet, week ended Sept. 21, 1918.

Complement.....	590
Total admissions, diseases and injuries.....	7
Total admissions, venereal diseases.....	0
Number of communicable diseases, exclusive of venereal diseases, 0.	

Diseases reported in 3 ships of the fleet, week ended Sept. 28, 1918.

Complement.....	546
Total admissions, diseases and injuries.....	7
Total admissions, venereal diseases.....	0
Number of communicable diseases, exclusive of venereal diseases, 0.	

Diseases reported in 14 ships of the fleet, week ended Oct. 5, 1918.

Complement.....	10, 485
Total admissions, diseases and injuries.....	275
Total admissions, venereal diseases.....	28
Number of communicable diseases, exclusive of venereal diseases, 61, as follows:	

	Cerebro spinal fever.	Diph- theria.	Influenza.	Malaria.	Measls.	Mumps.	Pneu- monia, broncho.	Pneu- monia, lobar.	Scarlet fever.	Typhoid fever.
U. S. S. De Kalb.....			56							
U. S. S. Denver.....			4							
U. S. S. Quinnebaug.....								1		

Diseases reported in 14 ships of the fleet, week ended Oct. 12, 1918.

Complement.....	11,489
Total admissions, diseases and injuries.....	169
Total admissions, venereal diseases.....	18

Number of communicable diseases, exclusive of venereal diseases, 70, as follows:

	Cerebro spinal fever.	Diph- theria.	Influenza.	Malaria.	Measles.	Mumps.	Pneu- monia, broncho.	Pneu- monia, lobar.	Scarlet fever.	Typhoid fever.
U. S. S. Denver.....			11					1		
U. S. S. Canonicus.....								1		
U. S. S. De Kalb.....			12							
U. S. S. Susquehanna.....			41				2			
U. S. S. Florida.....						1				
U. S. S. Texas.....						1				

Diseases reported in 15 ships of the fleet, week ended Oct. 19, 1918.

Complement.....	12,020
Total admissions, diseases and injuries.....	315
Total admissions, venereal diseases.....	15

Number of communicable diseases, exclusive of venereal diseases, 115, as follows:

	Cerebro spinal fever.	Diph- theria.	Influenza.	Malaria.	Measles.	Mumps.	Pneu- monia, broncho.	Pneu- monia, lobar.	Scarlet fever.	Typhoid fever.
U. S. S. Minneapolis.....			2							
U. S. S. Marblehead.....			67							
U. S. S. Chattanooga.....			1							
U. S. S. Denver.....			4							
U. S. S. De Kalb.....			2			1				
U. S. S. Arizona.....							2			
U. S. S. Finland.....			3							
U. S. S. Princess Matoika.....			5		2					
U. S. S. Frederick.....	1		5							
U. S. S. Mount Vernon.....			20							

Diseases reported in 57 ships of the fleet, week ended Oct. 26, 1918.

Complement.....	38,685
Total admissions, diseases and injuries.....	446
Total admissions, venereal diseases.....	36

Number of communicable diseases, exclusive of venereal diseases, 113 as follows:

	Cerebro- spinal fever.	Diph- theria.	Influenza.	Malaria.	Measles.	Mumps.	Pneu- monia, broncho.	Pneu- monia, lobar.	Scarlet fever.	Typhoid fever.
U. S. S. North Dakota.....			6							
U. S. S. Kentucky.....								1		
U. S. S. Mississippi.....			5			2				
U. S. S. Ohio.....						2	1			
U. S. S. Wisconsin.....						1	1			
U. S. S. Illinois.....							1			
U. S. S. Maine.....				1						
U. S. S. South Carolina.....					1					
U. S. S. Minneapolis.....			3							
U. S. S. De Kalb.....			5			3				
U. S. S. North Carolina.....			9							
U. S. S. Marblehead.....			9							
U. S. S. Louisville.....			2							
U. S. S. Cleveland.....			8							
U. S. S. Pastores.....			1							
U. S. S. Calamares.....			1							
U. S. S. Hancock.....			1							
U. S. S. Mount Vernon.....			7							
U. S. S. Lenape.....			2							
U. S. S. Matsonia.....			15							
U. S. S. Powhatan.....			1							
U. S. S. America.....			1							
U. S. S. Manchuria.....			2							
U. S. S. George Washington.....			7							
U. S. S. Princess Matoika.....			4					1		
U. S. S. Mongolia.....			2							
U. S. S. President Grant.....			1							
U. S. S. Cheyenne.....			3				3			

INSTRUCTIONS TO MEDICAL OFFICERS.

Hereafter triple typhoid lipo-vaccine will be furnished in place of the triple typhoid saline vaccine which has been used in the past.¹ The Army is prepared to furnish the lipo-vaccine and is now using it to vaccinate Army personnel against typhoid and para typhoid fevers.

The following instructions covering its use will be sent with each consignment:

Each c. c. of this vaccine contains 2,500 million bacillus typhosus, 2,500 million bacillus paratyphosus A and 2,500 million bacillus paratyphosus B. On standing in the cold some of the fats may separate and cause a precipitate. This will disappear on standing a short time at room temperature.

A single dose of 1 c. c. of this vaccine is sufficient. It is especially important that this vaccine be given *subcutaneously*, and not intravenously, intramuscularly, or under the fascia. In order to insure this, you will pick up a fold of skin and inject into the subcutaneous tissue of that fold. Practically all the severe reactions that have been reported have been due to neglect of this precaution. The deep injection of this vaccine may lead to fat embolism and defeats the object of the inoculation.

The precautions to be taken regarding absence of temperature or disease are the same as are given for typhoid vaccine in Circular No. 16, War Department, Office of the Surgeon General, March 20, 1916. It is advisable to give the vaccine about 4 o'clock in the afternoon, and the man should be required to remain in quarters for 24 hours after the injection.

Extract from Circular No. 16, War Department, Office of the Surgeon General, Washington, March 20, 1916:

The site of the inoculation is the arm at the insertion of the deltoid muscle. If for any reason this site can not be used, the needle may be introduced in the back, over the lower portion of the scapula, or in the chest below the clavicle. The dose is to be given *subcutaneously* and not into the muscles nor into the skin. The arm should be cleansed as for any other operation. Tincture of iodine painted over the dry skin, before and after the injection, has proved satisfactory.

The ampul should be washed off in an antiseptic solution and opened after making one or more cuts near the top with a file. The vaccine can be drawn out of the container with a syringe. The syringe and needle should be sterilized by boiling. To insure perfect sterilization draw the piston out to its full length, or remove it entirely, so that the barrel is full of water during the boiling. A fresh needle should be used for each man, or, if one needle must be used on two or more men, it should be resterilized before each injection.

No person should be vaccinated who is not perfectly healthy and *free from fever*. The temperature will be taken before vaccination is begun, and, in doubtful cases the urine should be examined; if fever or any other symptoms of illness are present the procedure should be postponed. This precaution is necessary to avoid vaccinating men who may be in the incubation stage of typhoid or other fever. Neither beer nor alcohol in any other form should be drunk on the day of treatment.

Under certain nomenclature titles the following terms are frequently used in entering the diagnosis on Form F cards: Condyle, cuneiform, phalanx, scaphoid, etc. To enable the Statistical Section to make proper classification, the foregoing terms, when used on Form F cards, should be amplified by definitely stating the location, viz:

Condyle: State whether internal or external and the bone involved.

Cuneiform: Carpal or tarsal.

Phalanx: Proximal, middle, or distal, and first, second, third, etc., finger or toe, and whether right or left hand or foot, as indicated.

Scaphoid: Carpal or tarsal.

Medical officers are invited to submit to the bureau any suggestions that they believe may be useful in extending the scope of this bulletin to render it of greater value. Questions in the field of preventive medicine will be welcomed and will be answered in accordance with the best available authority.

Criticism of anything contained in the body of the bulletin or in any of the statistical tables will be appreciated. In referring to any article appearing in a bulletin, reference should be made to the letters and numbers in the upper right-hand corner, as well as to the serial number.

The following statistics are furnished for the information of medical officers:

The annual rates shown in the tables are obtained in the following way: The figure representing the total original admissions to the sick list or the number of deaths reported during the week is multiplied by 1,000 and divided by the complement. The quotient is then multiplied by 52. As weekly figures always fluctuate widely, *caution must be used in interpreting annual rates calculated on a weekly basis*. In the following tables it may be taken for granted where no figures appear that the disease did not occur, or, if in reference to hospitals, that no case was admitted. The figures in column "Total admissions for communicable diseases" do not include venereal diseases.

W. C. BRAISTED.

¹ Medical officers who require additional saline vaccine to complete a series of inoculations already begun with the triple typhoid saline vaccine should so state in letters or telegrams requesting vaccine.

TABLE 1.—ADMISSIONS TO SICK LIST AND ADMISSION RATES, TRAINING STATIONS, CAMPS, AND OTHER LARGER SHORE STATIONS, WEEK ENDED NOV. 2, 1918.

	Diseases and injuries.				Venereal diseases.								
	Complement.	Total admissions, all causes.	Annual rate per 1,000.	Average rate since July 1, 1918.	Total admissions, venereal.	Annual rate per 1,000.	Average rate since July 1, 1918.	Chancroid.	Annual rate per 1,000.	Gonococcus infec- tion.	Annual rate per 1,000.	Syphilis.	Annual rate per 1,000.
FIRST NAVAL DISTRICT.													
Air station, Chatham, Mass.	428	7	850.20	484.19	1	121.16	43.42			1	121.16		
Ammunition depot, Hingham, Mass.	350	7	1,040.00	2,324.32			21.32						
Aviation school, Cambridge, Mass.	1,700	45	1,376.44	3,068.36	2	60.84	25.58			2	60.84		
Detention camp, Deer Island, Mass.	1,091	12	571.38	1,707.02			40.32						
District headquarters, Boston, Mass.	511	12	1,220.97	2,264.92			16.05						
District section headquarters, Boston, Mass. (Lockwood's Basin)	1,815	20	572.52	1,549.74	2	57.20	17.94			1	28.60	1	28.60
District section headquarters, Bar Harbor, Me.	358	7	1,016.60	2,240.68	1	145.08	09.26	1	145.08				
District section headquarters, Portland, Me.	364	4	570.96	1,437.73	2	285.48	69.68			2	285.48		
District section headquarters, Provincetown, Mass.	350	1	148.20	1,366.75			143.13						
District section headquarters, Rockland, Me.	430	10	1,209.00	3,061.82			70.91						
Fuel oil school, Quincy, Mass.	900	1	57.72	1,065.07			26.00						
Naval prison, Portsmouth, N. H.	2,000	15	390.00	2,015.50	1	32.24	16.64			1	32.24		
Navy yard, Boston, Mass.	1,596	25	814.32	2,042.08	1	42.64	11.88			1	42.64		
Navy yard, Portsmouth, N. H.	1,211	2	85.80	928.08	1	107.12	26.52			1	107.12		
Officers' material school, Cambridge, Mass.	484	4	429.52	1,177.21	1	21.32	43.26			2	21.32		
Radio school, Harvard University	4,780	68	739.44	1,334.35	2	48.88	71.29	1	9.36	3	29.12	1	9.36
Receiving ship Boston, Commonwealth Pier	5,303	24	235.04	855.76	5	102.44	70.60			1	102.44		
Rifle range, Wakefield, Mass.	506	12	1,232.92	1,964.04	1	158.08	70.25			3	158.08		
Training camp, Bunkin Island, Boston, Mass.	986	38	2,003.56	1,492.51	3		21.72						
Training camp, Hingham, Mass.	1,090	22	1,049.36	1,426.42									
Other stations.	132			196.75									
SECOND NAVAL DISTRICT.													
District section headquarters, New London, Conn.	4,000	29	377.00	875.80	1	13.00	36.27			1	13.00		
Receiving barracks, Newport, R. I.	1,916	8	216.84	836.22			5.45						
Submarine base, New London, Conn.	2,687	31	599.56	1,123.16	2	38.48	75.24			2	38.48		
Training station, Newport, R. I.	6,599	39	306.80	851.12	1	7.80	33.01			1	7.80		
Other stations.													
THIRD NAVAL DISTRICT.													
Air station, Bayshore, Long Island, N. Y.	880	8	472.68	822.00	1	58.76	23.85			1	58.76		
Air station, Montauk, N. Y.	387			366.25									
Air station, Rockaway, Long Island, N. Y.	1,230	10	422.76	708.46			58.96						
Ammunition depot, Iona Island, N. Y.	380	2	273.52	1,296.08			19.53						

Armed draft detail, New York:												
In barracks.....	2, 426											
Afloat.....	4, 056											
Auxiliary reserve school, Pelham Bay, N. Y.....												
District section headquarters, Bath Beach, Long Island, N. Y.....	6, 482	29	232.44	601.00	9	71.76	101.87		5	40.04	4	31.72
District section headquarters, Montauk, Long Island, N. Y.....	1, 013	19	975.00	1, 004.95	1	50.96	37.43		1	50.96		
District section headquarters, Sayville, Long Island, N. Y.....	1, 313	12	474.76	900.08	1	39.52	43.08	1	39.52			
District section headquarters, Tompkinsville, N. Y.....	75											
District section headquarters, Whitestone, Long Island, N. Y.....	438	3	355.68	1, 877.06			16.86					
District section headquarters, New Haven, Conn.....	257	3	606.84	279.44								
District section headquarters, Sayville, Long Island, N. Y.....	709	12	879.84	1, 800.09	1	73.32	72.35		1	73.32		
District section headquarters, Brooklyn, N. Y.....	250	2	416.00	1, 961.14			59.42					
Federal rendezvous, Brooklyn, N. Y.....	1, 772	22	645.32	1, 550.86	2	58.24	28.65		2	58.24		
Fleet Supply base, Brooklyn, N. Y.....	893	9	523.64	672.49								
Navy yard, including marine barracks, New York.....	1, 700	13	397.28	973.18	2	60.84	38.39	1	30.16	30.16		
Office of supervisor, auxiliary reserve, New York.....	1, 600	18	585.00	1, 029.29	2	65.00	43.10		2	65.00		
Officers' material school, Princeton, N. J.....	600	1	86.32	1, 011.04								
Recruiting station, New York.....	258	14	821.52	3, 337.23								
Reserve force headquarters, New York.....	3, 600	49	707.72	876.11			14.30					
Receiving ship New York, including Ellis Island.....	5, 300	49	480.48	656.92	4	39.00	55.12	1	9.36	29.12		
Rifle range, Peekskill, N. Y.....	698	7	521.04	2, 074.83	1	74.36	10.62		1	74.36		
Steam engineering school, Stevens Institute, Hoboken, N. J.....	1, 000	14	728.00	1, 566.76	1	52.00	29.71		1	52.00		
Training camp, Pelham Bay, N. Y.....	12, 476	162	674.96	751.85	5	20.80	32.74		5	20.80		
Other stations.....	35	1	1, 485.64	596.23								
FOURTH NAVAL DISTRICT.												
Air station, Cape May, N. J.....	447	2	232.44	814.24			49.64					
Ammunition depot, Dover, N. J.....	350	7	1, 040.00	1, 931.28			29.64					
District section headquarters, Cape May, N. J.....	1, 500	7	242.32	582.34	2	69.16	37.70		1	34.34	1	34.34
District section headquarters, Lewes, Del.....	700			2, 365.48								
Distributing barracks, Pier No. 19, Philadelphia, Pa.....	645	2	161.20	1, 655.97	1	80.60	453.21		1	80.60		
Navy yard, Philadelphia, Pa.....	1, 152	32	1, 446.64	4, 106.05								
Officer's material school, University of Pennsylvania, Philadelphia, Pa.....	221			1, 235.43								
Radio school, Philadelphia, Pa.....	300	2	346.32	1, 312.18	1	173.16	74.21		1	173.16		
Receiving ship, Philadelphia, Pa.....	6, 825	67	510.12	956.25	9	67.60	122.82	1	7.28	45.24	2	15.08
Training camp, Cape May, N. J.....	1, 414	12	440.96	733.63	4	146.64	43.64		4	146.64		
Other stations.....												
FIFTH NAVAL DISTRICT.												
Air station, Hampton Roads, Va.....	1, 100			462.36			7.80					
Ammunition depot, Portsmouth, Va.....	694	5	374.40	1, 129.12								
District section headquarters, Baltimore, Md.....	500	7	728.00	1, 962.87			77.94					
District section headquarters, Cherrystone, Va.....	250	2	416.00	1, 550.51	1	208.00	37.14		1	208.00		
Marine barracks, Quantico, Va.....	8, 000	258	1, 677.00	1, 265.37	2	13.00	31.99		2	13.00		
Training station, Hampton Roads, Va.....	10, 581	205	1, 007.24	1, 434.70	13	63.44	66.25	1	4.68	48.88	2	9.36

TABLE 1.—ADMISSIONS TO SICK LIST AND ADMISSION RATES, TRAINING STATIONS, CAMPS, AND OTHER LARGER SHORE STATIONS, WEEK ENDED NOV. 2, 1918—Continued.

	Diseases and injuries.				Venereal diseases.									
	Complement.	Total admissions, all causes.	Annual rate per 1,000.	Average rate since July 1, 1918.	Total admissions, venereal.	Annual rate per 1,000.	Average rate since July 1, 1918.	Chancroid.	Annual rate per 1,000.	Gonococcus infec- tion.	Annual rate per 1,000.	Syphilis.	Annual rate per 1,000.	
FIFTH NAVAL DISTRICT—continued.														
Navy yard, including marine barracks, Norfolk, Va.	2, 215	5	117.00	1, 177.86			15.01							
Receiving ship, including St. Helena, Norfolk, Va.	7, 572	38	260.52	702.02	6	41.08	89.35			4	27.04	2	13.52	
Rifle range, Glenburnie, Md.	375	4	554.32	1, 249.78			111.79							
Rifle range, Virginia Beach, Va.	790	4	263.12	688.65			34.77							
Other stations.														
SIXTH NAVAL DISTRICT.														
Marine barracks, Paris Island, S. C.	8, 549	389	2, 366.00	1, 153.82	15	91.00	62.15			11	66.56	4	23.92	
Navy yard, Charleston, S. C.	1, 000	5	260.00	353.60			10.40							
Receiving ship, Charleston, S. C.	669	18	1, 398.80	1, 739.61	16	1, 243.32	324.48	3	232.96	13	1, 010.36			
Rifle range, Charleston, S. C.	1, 000	6	312.00	541.94	1	52.00	10.40			1	52.00			
Training camp, Charleston, S. C.	4, 349	110	1, 315.08	235.32	1	11.96	121.54			1	11.96			
Other stations.	1, 273	22	898.56	3, 306.78			41.18							
SEVENTH NAVAL DISTRICT.														
Air station, Miami, Fla. (naval).	1, 387	30	1, 124.24	1, 416.53	2	74.88	43.95	1	37.44	1	37.44			
Air station, Miami, Fla. (marine).	743	12	839.80	592.21			30.56							
Training camp, Key West, Fla.	2, 236	45	1, 046.24	1, 485.84	3	69.68	85.38			3	69.68			
Other stations.														
EIGHTH NAVAL DISTRICT.														
Training camp, Gulfport, Miss.	1, 901	17	464.88	3, 119.73	2	54.60	115.50	1	27.04			1	27.04	
Training camp, New Orleans, La.	2, 177	48	1, 146.60	2, 081.40	10	238.68	156.31	1	23.40	5	119.08	4	95.16	
Training camp, Pensacola, Fla.	5, 508	91	859.04	1, 361.33			23.07							
Other stations.														
NINTH, TENTH, AND ELEVENTH NAVAL DISTRICTS.														
Auxiliary reserve school, Chicago, Ill.	1, 554	20	669.24	1, 366.21	3	100.36	33.36			3	100.36			
Aviation detachment, Curtiss Aeroplane Plant, Buffalo, N. Y.	700	7	520.00	1, 271.39			47.59							
District section headquarters, Cleveland, Ohio.	1, 200	13	563.16	819.59	1	43.16	69.30			1	43.16			
District section headquarters, Detroit, Mich.	650	8	639.60	769.40	1	79.56	73.19	1	79.56					

[illegible]

TABLE 1.—ADMISSIONS TO SICK LIST AND ADMISSION RATES, TRAINING STATIONS, CAMPS, AND OTHER LARGER SHORE STATIONS, WEEK ENDED NOV. 2, 1918—Continued.

	Total admissions com- municable diseases, ex- clusive of influenza.	Annual rate per 1,000.	Average rate since July 1, 1918.	Cerebrospinal fever.	Annual rate per 1,000.	Diphtheria.	Annual rate per 1,000.	Malaria.	Annual rate per 1,000.	German measles.	Annual rate per 1,000.	Measles.	Annual rate per 1,000.	Mumps.	Annual rate per 1,000.
SIXTH NAVAL DISTRICT.															
Marine barracks, Paris Island, S. C.	31	188.24	35.96											1	5.72
Navy yard, Charleston, S. C.			10.40												
Receiving ship, Charleston, S. C.			45.50												
Rifle range, Charleston, S. C.	1	52.00	10.40												
Training camp, Charleston, S. C.	4	47.32	47.93												
Other stations.			263.77												
SEVENTH NAVAL DISTRICT.															
Air station, Miami, Fla. (Naval).	2	74.88	56.81											1	37.44
Air station, Miami, Fla. (Marine).	1	69.68	21.03												
Training camp, Key West, Fla.	8	184.60	38.99											7	162.76
Other stations.															
EIGHTH NAVAL DISTRICT.															
Training camp, Gulfport, Miss.			42.57												
Training camp, New Orleans, La.	5	119.08	111.05											1	23.40
Training camp, Pensacola, Fla.	3	28.08	15.38												
Other stations.															
NINTH, TENTH, AND ELEVENTH NAVAL DISTRICTS.															
Auxiliary reserve school, Chicago, Ill.	2	66.56	127.70											2	66.56
Aviation detachment, Curtiss Aeroplane Plant, Buffalo, N. Y.			44.24												
District section headquarters, Cleveland, Ohio.			76.75												
District section headquarters, Detroit, Mich.	2	159.64	29.90												
Dunwoody Industrial Institute, Minneapolis, Minn.	18	603.72	189.58											15	502.84
Rifle range, Camp Logan, Waukegan, Ill.			580.09												
Training camp, Detroit, Mich.			191.68												
Training station, Great Lakes, Ill.	28	36.40	182.27											26	33.80
Other stations.															

TWELFTH NAVAL DISTRICT.

TWELFTH NAVAL DISTRICT.														
Air station, San Diego, Cal.....	1	33.80	23.58									1	33.80	
District section headquarters, San Diego, Cal.....	4	214.76	74.70											4 214.76
District section headquarters, San Francisco, Cal.....			106.89											
Submarine base, San Pedro, Cal.....	1	39.52	48.47											
Training camp, Mare Island, Cal.....	22	152.36	259.36											22 152.36
Training camp, San Diego, Cal.....	50	528.84	536.32								3 31.72			47 497.12
Training camp, San Pedro, Cal. (municipal pier).....			39.11											
Training station, San Francisco, Cal.....	16	176.28	368.17											15 165.36
Other stations.....														
THIRTEENTH NAVAL DISTRICT.														
Navy yard, including marine barracks, Puget Sound, Wash.....	2	94.64	29.46											2 94.64
Receiving ship, including training camp, Puget Sound, Wash.....	8	68.64	80.42									8	68.64	
Training camp, Seattle, Wash.....	29	372.32	136.31											7 91.96
Other stations.....														
Total.....	316	66.04	114.67	1	.20	2	.41	10	2.08	4	.52	15	3.12	171 35.88

TABLE 1.—ADMISSIONS TO SICK LIST AND ADMISSION RATES, TRAINING STATIONS, CAMPS, AND OTHER LARGER SHORE STATIONS,
WEEK ENDED NOV. 2, 1918—Continued.

[illegible]

District section headquarters	Sayville,	Long Island, N. Y.
District section headquarters, Tompkinsville, N. Y.		
District section headquarters, Whitestone, Long Is- land, N. Y.		
Federal rendezvous, Brooklyn, N. Y.	3	174.20
Fleet supply base, Brooklyn, N. Y.	1	30.16
Navy yard, including Marine barracks, New York		
Office of supervisor, auxiliary reserve, New York	1	32.50
Officer material school, Princeton, N. J.		
Recruiting station, New York		
Reserve force headquarters, New York	5	71.76
Receiving ship, New York, including Ellis Island	1	9.36
Rifle range, Feelskill, N. Y.		
Steam engineering school, Stevens Institute, Hobo- ken, N. J.		
Training camp, Pelham Bay, N. Y.	6	24.96
Other stations		
FOURTH NAVAL DISTRICT.		
Air station, Cape May, N. J.		
Ammunition depot, Dover, N. J.		
District section headquarters, Cape May, N. J.		
District section headquarters, Lewes, Del.		
Distributing barracks, Pier No. 19, Philadelphia, Pa..		
Navy yard, Philadelphia, Pa.		
Officer material school, University of Pennsylvania, Philadelphia, Pa.		
Radio school, Philadelphia, Pa.		
Receiving ship, Philadelphia, Pa.		
Training camp, Cape May, N. J.		
Other stations		
FIFTH NAVAL DISTRICT.		
Air station, Hampton Roads, Va.		
Ammunition depot, Portsmouth, Va.		
District section headquarters, Baltimore, Md.	1	104.00
District section headquarters, Cherrystone, Va.		
Marine barracks, Quantico, Va.	3	19.24
Training station, Hampton Roads, Va.	8	39.00
Navy yard, including marine barracks, Norfolk, Va.		
Receiving ship, including St. Helena, Norfolk, Va.	1	6.76
Rifle range, Glenburnie, Md.		
Rifle range, Virginia Beach, Va.		
Other stations		
SIXTH NAVAL DISTRICT.		
Marine barracks, Paris Island, S. C.	30	182.00
Navy yard, Charleston, S. C.		
Receiving ship, Charleston, S. C.		
Rifle range, Charleston, S. C.	1	52.00
Training camp, Charleston, S. C.	4	47.32
Other stations		

TABLE 1.—ADMISSIONS TO SICK LIST AND ADMISSION RATES, TRAINING STATIONS, CAMPS, AND OTHER LARGER SHORE STATIONS, WEEK ENDED NOV. 2, 1918—Continued.

	Pneumonia.	Annual rate per 1,000.	Tuberculosis.	Annual rate per 1,000.	Scarlet fever.	Annual rate per 1,000.	Smallpox.	Annual rate per 1,000.	Typhoid.	Annual rate per 1,000.	Influenza.	Annual rate per 1,000.
SEVENTH NAVAL DISTRICT.												
Air station, Miami, Fla. (naval).....	1	37.44									4	149.76
Air station, Miami, Fla. (marine).....	1	69.68									4	279.76
Training camp, Key West, Fla.....											26	604.24
Other stations.....												
EIGHTH NAVAL DISTRICT.												
Training camp, Gulfport, Miss.....											4	109.20
Training camp, New Orleans, La.....	1	23.40	1	23.40							13	310.44
Training camp, Pensacola, Fla.....	1	9.36									25	235.56
Other stations.....												
NINTH, TENTH, AND ELEVENTH NAVAL DISTRICTS.												
Auxiliary reserve school, Chicago, Ill.....											7	234.00
Aviation detachment, Curtiss Aeroplane Plant, Buffalo, N. Y.....												
District section headquarters, Cleveland, Ohio.....											12	520.00
District section headquarters, Detroit, Mich.....	2	159.64									2	159.64
Dunwoody Industrial Institute, Minneapolis, Minn.....	3	100.36									2	67.08
Rifle range, Camp Logan, Waukegan, Ill.....											4	257.40
Training camp, Detroit, Mich.....												
Training camp, Great Lakes, Ill.....	2	2.60									40	52.00
Other stations.....												
TWELFTH NAVAL DISTRICT.												
Air station, San Diego, Cal.....											170	5,796.44
District section headquarters, San Diego, Cal.....											44	2,366.00
District section headquarters, San Francisco, Cal.....											47	814.32
Submarine base, San Pedro, Cal.....	1	39.52									31	1,232.92
Training camp, Mare Island, Cal.....											44	304.72
Training camp, San Diego, Cal.....											66	698.36
Training camp, San Pedro, Cal. (municipal pier).....	1	10.92									18	296.40
Training station, San Francisco, Cal.....												
Other stations.....												
THIRTEENTH NAVAL DISTRICT.												
Navy yard, including marine barracks, Puget Sound, Wash.....												
Receiving ship, including training camp, Puget Sound, Wash.....											5	42.64
Training camp, Seattle, Wash.....	22	282.36									18	230.88
Other stations.....												
Total.....	105	21.84	4	.52	4	.52					1,581	332.80

TABLE 2.—SUMMARY OF REPORTS FROM NAVAL HOSPITALS AND SICK QUARTERS, WEEK ENDED OCT. 26, 1918.

Hospitals.	Cerebro-spinal fever.		Diphtheria.		Malaria.		German measles.		Measles.		Mumps.		Pneumonia.		Scarlet fever.		All causes.		
	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Discharged.
Annapolis.....	1		1						1	1	7		55	1			330	81	86
Cape May.....					1	1							1				104	35	37
Charleston.....					3						7	2	6	2			465	73	195
Chelsea.....	1		8				4		8	1	40	16	64	6			759	164	140
Great Lakes.....	33	1	10	2	1				5		8		1,359	2			1,738	97	220
Gulfport.....					1						1		63	8			136	27	55
Hampton Roads.....	15	2	7	2					9	4	21	6	368	9	2	1	673	84	79
Key West.....					1				1		3	1	113	19			234	51	180
League Island.....					2								5				173	35	56
Mare Island.....	2		1				7		3		328	58	13				726	174	341
New London.....			1		1	1			2				36	5	2	2	214	63	80
Newport.....	11				3				13	2	3	2	234	7	13		717	90	186
New York.....	12	2	29		8				6	3	19	8	158	45	1		2,943	675	689
Norfolk.....	10	2	1		1				2		6		367	23	3		1,653	233	241
New Orleans.....			11	3							3	3	9	4			165	73	103
Paris Island.....	1								3				1				134	38	25
Pelham Park.....			2				1	1			1		293	10	1	1	643	34	442
Pensacola.....					7	1					2		58	6			181	66	73
Philadelphia.....			6						1		2	1	18	2	2		697	64	254
Portsmouth.....	2		1		1	1					1		62	3			189	28	57
Puget Sound.....	1		1						9	2	24	11	19				254	50	68
Quantico ¹																			
San Diego.....			1		3				27	17	89	64	14	4			375	251	192
Washington.....											4	4	13				241	52	83
Total.....	89	7	80	7	33	4	12	1	90	30	569	176	3,328	156	24	4	13,739	2,538	3,882

¹ Report not received.

TABLE 3.—NUMBER OF ADMISSIONS AND ANNUAL RATES, ENTIRE NAVY, WEEK ENDED OCT. 19, 1918.

[Rates based on an estimated complement of 550,000.]

Class.	Number of cases.	Annual rate per 1,000.	Class.	Number of cases.	Annual rate per 1,000.
Diseases of blood.....			Diseases of motor system.....	78	
Diseases of circulatory system.....	36		Diseases of nervous system.....	68	
Diseases of digestive system.....	687		Diseases of respiratory system.....	1,337	126.36
Diseases of ductless glands and spleen.....			Diseases of skin, hair, and nails.....	70	
Diseases of ear.....	61		Hernia.....	37	
Diseases of eye and adnexa.....	46		Miscellaneous diseases and conditions.....	126	
Diseases of genito-urinary system (nonvenereal).....	165		Parasites (fungi and certain animal parasites).....	68	
Diseases of infective type (non-venereal).....	8,945	845.52	Tumors.....	6	
Diseases of infective type (venereal).....	729	68.64	Injuries.....	456	
Diseases of lymphatic system.....	32		Poisons.....	6	
Diseases of mind.....	35			12,988	1,227.72

Chancroid infection.....	155
Gonococcus infection.....	450
Syphilis.....	124



TABLE 4.—TOTAL ADMISSIONS REPORTED BY FORM F CARDS FOR CERTAIN COMMUNICABLE DISEASES, OTHER THAN VENEREAL DISEASES, AND ANNUAL RATES, ENTIRE NAVY, WEEK ENDED OCT. 19, 1918.

[Rates based on an estimated complement of 550,000.]

Disease.	Number of admissions.	Annual rate per 1,000.	Disease.	Number of admissions.	Annual rate per 1,000.
Cerebrospinal fever.....	15	1.41	Chicken pox.....	6	0.56
Diphtheria.....	19	1.79	Dengue.....	19	1.79
Malaria.....	45	4.23	Influenza.....	8,315	785.72
Measles.....	32	3.01	Paratyphoid fever.....	1	.094
Mumps.....	209	19.76	Whooping cough.....	2	.19
Pneumonia, broncho.....	584	55.12	Tuberculosis.....	31	2.92
Pneumonia, lobar.....	203	18.72			
Scarlet fever.....	8	.75	Total.....	9,491	906.36
Typhoid fever.....	2	.19			

TABLE 5.—DEATHS REPORTED, ENTIRE NAVY, WEEK ENDED NOV. 2, 1918.

[Rates based on an estimated complement of 600,000.]

Influenza-pneumonia.....	638
Influenza-meningitis, cerebrospinal.....	2
Cerebrospinal fever.....	5
Typhoid fever.....	1
Other infections.....	2
Drowning.....	4
Other accidents and injuries.....	6
Total.....	658
Annual death rate per thousand, all causes.....	56.99
Annual death rate per thousand, diseases only.....	56.16

¹ Pneumococcus, 2.